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JAMES M. STOVER TERADATA CORPORATION 2835 MIAMI VILLAGE DRIVE MIAMISBURG, OH 45342			EXAMINER NELSON, FREDA ANN	
			ART UNIT 3628	PAPER NUMBER
			MAIL DATE 04/13/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/730,629

Applicant(s)

RAMESH ET AL.

Examiner

FREDA A. NELSON

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-15, 17-28, 30-42 and 44-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-15, 17-28, 30-42 and 44-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

The amendment received on January 9, 2009 is acknowledged and entered. Claims 1, 3-4, 8-9, 15, 17-18, 22-23, 28, 30-31, 35-36, 38, 42, 44-45, and 49-50 have been amended. Claims 2, 16, 29, and 43 have been canceled. No claims have been added. Claims 1, 3-15, 17-28, 30-42, and 44-56 are currently pending.

Response to Amendments and Arguments

Applicant's arguments filed January 9, 2009 have been fully considered but they are not persuasive.

1. The Applicant argues that in regards to the double patenting rejection, the Applicant believes that the other rejections have been resolved, as described below, and respectfully requests that this provisional rejection be withdrawn, however, the Examiner asserts that the rejections have not been resolved and the double patenting rejection is being upheld.
2. In response to Applicant's argument that in regards to claims 1, 15, 28, and 42, "Access Path Selection" does not teach or suggest "determining that a stored actual access path cost for the access path exists, and, in response, substituting the stored actual access path cost for the estimated access path cost, the stored actual access path cost for the access path being a measured cost of executing the predicate using the access path," "measuring the actual cost of executing the predicates in the request," and "storing the measured actual costs as actual access path costs", the Examiner asserts that Osborn et al.

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discloses in particular, for each new query, a cost optimizer located within the computer system DBMS determines a most efficient execution plan for accessing the requested data, along with an estimate of the corresponding (relative) system "cost" for executing the query. This estimated cost is returned to the QPP module at the respective user station, which employs a "nearest neighbor" algorithm to determine an estimated central processing unit ("CPU") time required for executing the present query by extrapolating CPU times recorded for past queries having the same or similar estimated costs for accessing the same, or similar, tables and items in the database. The estimated CPU time for the present query is then multiplied by a current ratio of total elapsed times to CPU times to produce an estimated total elapsed time for the system to respond to the present query (col. 2, lines 9-23). Osborn et al. further discloses each user station records pertinent information for each new user query, which is collected and maintained by the host computer 22 in a query history; wherein the query history preferably includes for each query an identification of the particular table(s) and columns that were accessed, whether the query was satisfied from a pre-computed summary, the estimated cost for the query, the actual CPU time used in running the query and the total elapsed time required to complete the query and respond to the user (col. 2, lines 24-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of "Access Path Selection" to include the system of Osborn et al. in order to make a profitable query by utilizing information from past queries to determine costs since the claimed invention is merely a combination of

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old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1, 15, 28, and 42 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 12, and 23 of copending Application No. 11/328,702 in view of "Access Path Selection in a Relational Database Management System" (hereinafter referred to as "Access Path Selection").

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As per claims 1, 12, and 23 of copending application 11/328,702, although the conflicting claims are not identical, they are not patentably distinct from each other because they are an obvious variation to the present application claims since both comparisons perform the same function, in the same way with the same result.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

Claims 1, 12, and 23, respectively, of Application No. 11/328,702

recite:

Claim 1:

A method for optimizing processing of a request, the request having one or more predicates, the method including:

creating a list of the one or more predicates in the request;

pruning from the list the predicates for which an actual cost has not been stored or for which a cost cannot be estimated;

selecting an access path for the each of the predicates;

processing the request using the selected access paths, producing one or more

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actual predicate costs; and

storing the one or more actual predicate costs.

Claim 12:

A computer program, stored on a tangible storage medium, for use in optimizing processing of a request, the request having one or more predicates, the program including executable instructions that cause a computer to:

create a list of the one or more predicates in the request;

prune from the list the predicates for which an actual cost has not been stored or for which a cost cannot be estimated;

select an access path for the each of the predicates;

process the request using the selected access paths, producing one or more actual predicate costs; and

store the one or more actual predicate costs.

Claim 23:

A database system including:

a massively parallel processing system including: one or more nodes; a plurality of CPUs, each of the one or more nodes providing access to one or more CPUs;

a plurality of data storage facilities, each of the one or more CPUs providing access to one or more data storage facilities;

a process for optimizing processing of a request, the request having one

or more predicates, the process including:

- creating a list of the one or more predicates in the request;

- pruning from the list the predicates for which an actual cost has not been stored or for which a cost cannot be estimated;

- selecting an access path for the each of the predicates;

- processing the request using the selected access paths, producing one or more actual predicate costs; and

- storing the one or more actual predicate costs.

4. Claim 1, 12, and 23 of U.S. Application No. 11/328,702 differs since it further recites additional claim limitations including creating a list of the one or more predicates in the request; and pruning from the list the predicates for which an actual cost has not been stored or for which a cost cannot be estimated. However, it would have been obvious to a person of ordinary skill in the art to modify claim 1 of U.S. Application No. 11/328,702 by removing the limitations directed to creating a list of the one or more predicates in the request; and pruning from the list the predicates for which an actual cost has not been stored or for which a cost cannot be estimated since the claims of the present application and the claim recited in U.S. Application 11/328,702 actually perform a similar function. It is well settled that the omission of an element and its function is an obvious expedient if the remaining elements perform the same function as before. *In re Karlson*, 136 USPQ 184 (CCPA 1963). Also note *Ex parte Rainu*, 168 USPQ 375 (Bd. App. 1969). Omission of a reference element whose function is not needed would be obvious to one of ordinary skill in the art.

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5. Also, claim 1, 12, and 23 of U.S. Application No. 11/328,702 differs since it fails to recite:

identifying the relations in the request; extracting the predicates from the request; for each predicate, associating the predicate with the one or more access paths identified for the one or more relations referenced in the predicate; estimating the cost of one or more access paths associated with the predicate; and for each access path, selecting the cheaper of the estimated access path cost and an actual access path cost, if one exists; processing the request using the selected access path, producing one or more actual path element costs.

"Access Path Selection" discloses" accessing a singing relation (pg 25, Sect 4, 1st ¶); receiving simple predicates specified by the user (pg 23, Sect 2, 2nd ¶); The catalog lookup potion of the OPTIMIZER also obtains statistics about the referenced relations, and the access paths available on each of them (pg. 24, 2nd ¶); and for single relations, the cheapest access path is obtained by evaluating the cost for each available access path (each index on the relation) (page 23, 2nd ¶),

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify claims 1, 12, and 23 of U.S. Application 11/328,702 and include the function of "Access Path Selection" in order to provide the user the ability select the cheapest access path when requesting a query.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the costs" in line 9. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "the actual cost " in line 20. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3-5, 15, 17-19, 28, 30-32, 42, and 44-46 are rejected under 35 U.S.C. 102(b) as being unpatentable over "Access Path Selection in a Relational Database Management System" (hereinafter referred to as "Access Path Selection"), in view of Osborn et al. (US Patent Number 6,026,391).

As per claims 1, 15, 28, and 42, "Access Path Selection" discloses a method for optimizing processing of a request, the request including one or more

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predicates, each predicate referencing one or more relations, the method including:

identifying the relations in the request (page 25, Sect.4, 1st ¶);

identifying one or more access paths for each relation (page 27, 2nd ¶-5th

¶);

identifying the predicates from the request (page 27);

for each predicate, associating the predicate with the one or more access paths identified for the one or more relations referenced in the predicate (page 27, 2nd ¶-5th ¶);

estimating the costs of executing the predicate using one or more access paths associated with the predicate (page 27, 2nd ¶-5th ¶); and

for each predicate, for each relation referenced in the predicate, selecting an access path from among the one or more access paths associated with the predicates (page 24 and 27).

"Access Path Selection" does not explicitly disclose for at least one access path for which a cost was estimated, determining that a stored actual access path cost for the access path exists, and, in response, substituting the stored actual access path cost for the access path being a measured cost of executing the predicate using the access path;

for each predicate, for each relation referenced in the predicate, selecting an access path from among the one or more access paths associated with the predicates;

executing the request using the selected access paths for the predicates, measuring the actual cost of executing the predicates in the request; and storing the measured actual costs as actual access path costs.

However, Osborn et al. discloses in particular, for each new query, a cost optimizer located within the computer system DBMS determines a most efficient execution plan for accessing the requested data, along with an estimate of the corresponding (relative) system "cost" for executing the query. This estimated cost is returned to the QPP module at the respective user station, which employs a "nearest neighbor" algorithm to determine an estimated central processing unit ("CPU") time required for executing the present query by extrapolating CPU times recorded for past queries having the same or similar estimated costs for accessing the same, or similar, tables and items in the database. The estimated CPU time for the present query is then multiplied by a current ratio of total elapsed times to CPU times to produce an estimated total elapsed time for the system to respond to the present query (col. 2, lines 9-23). Osborn et al. further discloses each user station records pertinent information for each new user query, which is collected and maintained by the host computer 22 in a query history; wherein the query history preferably includes for each query an identification of the particular table(s) and columns that were accessed, whether the query was satisfied from a pre-computed summary, the estimated cost for the query, the actual CPU time used in running the query and the total elapsed time required to complete the query and respond to the user (col. 2, lines 24-33).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of "Access Path Selection" to include the system of Osborn et al. in order to make a profitable query by utilizing information from past queries to determine costs since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

As per claims 3, 17, 30, and 44, "Access Path Selection" discloses the method, computer program, and database system of claims 1, 15, 28, and 42, respectively, where estimating the cost of executing the predicates using the one or more access paths includes: retrieving estimated costs stored in a data dictionary (page 24, Sect. 3, 2nd ¶; page 27, 2nd -4th ¶).

As per claims 4, 18, 31, and 45, "Access Path Selection" discloses the method, computer program, and database system of claims 1, 15, 28, and 42, respectively, where estimating the cost of executing the predicates using the one or more access paths includes: performing selectivity costing based on one or more of selectivity, cardinality and statistics (page 25, Sect 4, 4th ¶- page 27, 1st ¶);.

As per claims 5, 19, 32, and 46, "Access Path Selection" discloses the method, computer program, and database system of claims 1, 15, 28, and 42, respectively, where selecting an access path further includes:

for each predicate, selecting the lowest cost access path from among the access paths associated with each predicate (page 27, 2nd ¶-5th ¶).

8. Claims **6-9, 20-23, 34-36, and 48-50** are rejected under 35 U.S.C. 103(a) as being unpatentable over "Access Path Selection in a Relational Database Management System" (hereinafter referred to as "Access Path Selection"), in view of Osborn et al. (US Patent Number 6,026,391), as applied to claims 1, 15, 28, 33, 42, and 47 above, and further in view of Tyunelev et al. (US Patent Number 6,957,211).

As per claims 6-7, 20-21, 34-35, and 48-49, "Access Path Selection" does not expressly disclose the method, computer program, and database system of claims 1, 15, 28, and 42, respectively, where requests are sorted into workload groups and the method further includes: categorizing the actual access path request element costs according to the workload group to which the request belongs; and

where selecting an access path for the request taking into consideration a stored actual access path request element cost includes:

taking into consideration the categorized actual access path request element cost, if it exists, for the workload group to which the request belongs.

However, Tyunelev et al. discloses the query optimization function

is tuned based on the workload specified by the user of the query. The workload can optionally be a workload the database 132 is operating under, or a workload selected by the DBMS based on a heuristic algorithm, rather than the workload specified by the user of the query (col. 10, lines 7-27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of "Access Path Selection" to include the feature of Tyunelev et al. in order to provide the user with a more cost effective query.

As per claims 8-9, 22-23, 35-36, and 49-50, "Access Path Selection" does not expressly disclose the method, computer program, and database system of claims 1, 15, 28, and 42, respectively, where storing the one or more actual request element costs includes: storing the one or more actual access path request element costs in a cache; and where storing the one or more actual access path request costs includes: backing up the stored one or more actual access path request element costs from the cache to a query capture data base.

However, Tyunelev et al. disclose CPU have workload-specific values; and other system statistics, such as caching ratios, maximum I/O system throughput, or average parallel process throughput, can also be measured separately for each workload (col. 61- col. 10, line 27). Tyunelev et al. further disclose the main memory 208 also may be used for storing temporary data, i.e., variables, or other intermediate information during execution of instructions by the processor(s) 204 (col. 3, line 55-col. 4, line 2; s col. 4, lines 13-16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of "Access Path Selection" to include the feature of Tyunelev et al. in order to provide the user the ability to store frequently accessed data to expedite data access.

9. Claims **10-11, 24-25, 37-38, 41, 51-52, and 55-56** are rejected under 35 U.S.C. 103(a) as being unpatentable over "Access Path Selection in a Relational Database Management System" (hereinafter referred to as "Access Path Selection"), in view of Osborn et al. (US Patent Number 6,026,391), as applied to claims 1, 15, 28, and 42 above, and further in view of Ziauddin (US Patent Number 5,899,986).

As per claims 10-11, "Access Path Selection" does not expressly disclose assigning the request to an one of a plurality of workload groups; and where selecting an access path for the request includes taking into consideration a stored actual access path request element cost if the one of the plurality of workload groups is identified for such processing; and where selecting an access path for the request does not include taking into consideration a stored actual access path request element cost if the one of the plurality of workload groups is not identified for such processing.

However, Ziauddin discloses when an RDBMS system receives a query, its optimizer analyzes the structure of the query, analyzes the various clauses (e.g. selection and join predicates) specified in the query, and examines existing data access paths (e.g. indexes) to formulate a strategy (e.g., method) of

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performing various relational operations (e.g., aggregation, sort, search, join, etc.) to produce the result of the query (col. 1, lines 27-38; col. 6, lines 3-14).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of "Access Path Selection" to include the feature of Tyunelev et al. and Ziauddin in order to provide the user the ability to quickly access the most important or frequently accessed data in order to expedite data access.

As per claims 12-13, 26-27, 39-40, and 53-54, Ziauddin does not expressly disclose performing at least a portion of the workload analysis off-line; or performing at least a portion of the workload analysis in real time. However, information as to performing the workload analysis off-line or in real time is non-functional language and given no patentable weight. Non-functional descriptive material cannot render non-obvious an invention that would otherwise have been obvious. See: *In re Gulack* 703 F.2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983) *In re Dembiczak* 175 F.3d 994, 1000, 50 USPQ2d 1614, 1618 (Fed. Cir. 1999). The specific example of non-functional descriptive material is provided in MPEP 2106, Section VI: (example 3) a process that differs from the prior art only with respect to non-functional descriptive material that cannot alter how the process steps are to be performed. The method steps, disclosed would be performed the same regardless of timing. Thus, this descriptive material will not distinguish the claimed invention from the prior art in terms of patentability. Therefore it would have been obvious to one of ordinary skill in the art at the time

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the invention was made that it was old and well known to perform analysis online, offline or in real-time because such timing does not functionally relate to the steps in the method claimed and does not patentably distinguish the claimed invention.

Examiner's Note

Examiner cited particular pages, columns, paragraphs and/or line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory

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period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRED A. NELSON whose telephone number is (571) 272-7076. The examiner can normally be reached on Monday and Wednesday-Friday, 8:30 AM -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Hayes can be reached on 571-272-6708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/F. A. N./

Examiner, Art Unit 3628

/John W Hayes/

Supervisory Patent Examiner, Art Unit 3628